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**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 10**

**NOVEMBER 2019**

**LIFE SCIENCES P1**

**MARKS: 150**

**TIME: 2½ hours**



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This question paper consists of 15 pages.

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## **INSTRUCTIONS AND INFORMATION**

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in your ANSWER BOOK.
3. Start the answer to EACH question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. Do ALL drawings in pencil and label them in blue or black ink.
7. Draw diagrams, tables or flow charts ONLY when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You may use a non-programmable calculator, protractor and a compass where necessary.
11. Round off ALL calculations to two decimals after the comma.
12. Write neatly and legibly.

**SECTION A****QUESTION 1**

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A–D) next to the question numbers (1.1.1–1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1 The basic unit of life is a...

- A zygote.
- B cell.
- C protoplasm.
- D nucleus.

1.1.2 What is the difference between cartilage and bone?

- A Bone is rubbery and cartilage is firm
- B Cartilage is rubbery and bone is firm
- C Bone is a more primitive tissue than cartilage
- D Bone is inside the body, and cartilage is outside

1.1.3 What type of a joint is formed between the humerus and the scapula?

- A Hinge joint
- B Ball and socket joint
- C Gliding joint
- D Pectoral girdle

1.1.4 Which of the following is a correct definition of stem cells?

- A Cells that have a definite nucleus enclosed by a membrane.
- B Cells that contain the three types of plastids.
- C Undifferentiated cells that have a potential to differentiate to form any tissue or organ in the body.
- D Cells that divide uncontrollably and continually resulting in the formation of swellings.

1.1.5 Material used to store genetic information in a cell is ...

- A ribosome.
- B deoxyribonucleic acid.
- C endoplasmic reticulum.
- D centrioles.

1.1.6 The diagrams below show certain skeletal diseases.



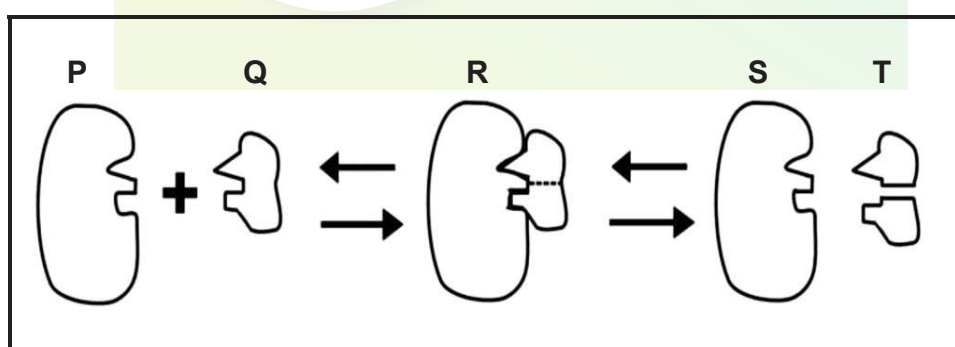
Which of the following combinations represent the diseases above?

	X	Y
A	Osteoporosis	Athlerosis
B	Osteomalacia	Osteoporosis
C	Arthritis	Osteoporosis
D	Athlerosis	Osteomalacia

1.1.7 The giant organic molecules containing elements **C, H, O, N** and sometimes **S** whose function is to repair worn out tissues:

- A Amino acids
- B Proteins
- C Carbohydrates
- D Lipids

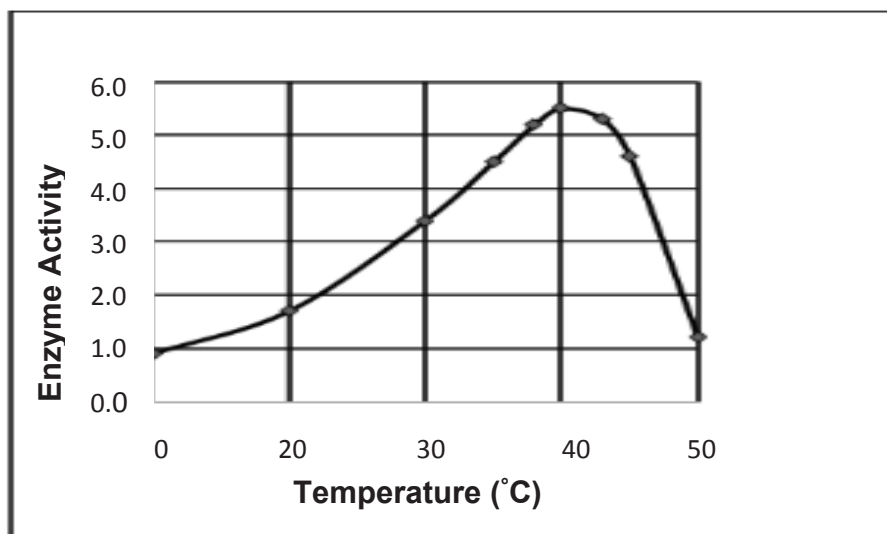
1.1.8 The diagram below shows enzyme action.



What does **Q** above represent?

- A An enzyme
- B Enzyme-substrate complex
- C Product
- D Substrate

1.1.9 The graph below shows the effect of temperature on enzyme activity.



What conclusion can be made from the graph above?

- A The higher the temperature, the higher the rate of enzyme activity.
- B Enzymes become denatured by high temperatures.
- C An increase in enzyme activity causes temperature to rise.
- D Enzymes function well at extremely low temperatures.

1.1.10 The nerve tissue that carries impulses from the sense organs (receptors) to the central nervous system:

- A Motor
- B Sensory
- C Bipolar
- D Connector

(10 x 2) (20)

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1–1.2.10) in the ANSWER BOOK.

- 1.2.1 A deficiency disease characterised by the yellowing of plant leaves
- 1.2.2 The building blocks of lipids
- 1.2.3 Cells that are rich in haemoglobin and transport oxygen to all parts of the body
- 1.2.4 The production of genetically identical organisms
- 1.2.5 A deficiency disease associated with bleeding gums
- 1.2.6 Resistance to infection by disease-causing organisms
- 1.2.7 Cell organelles that are centres of cellular respiration
- 1.2.8 Green pigment found in green plants
- 1.2.9 The units used to measure the tiny structure of a cell using a microscope
- 1.2.10 The apparatus used to measure the rate of transpiration

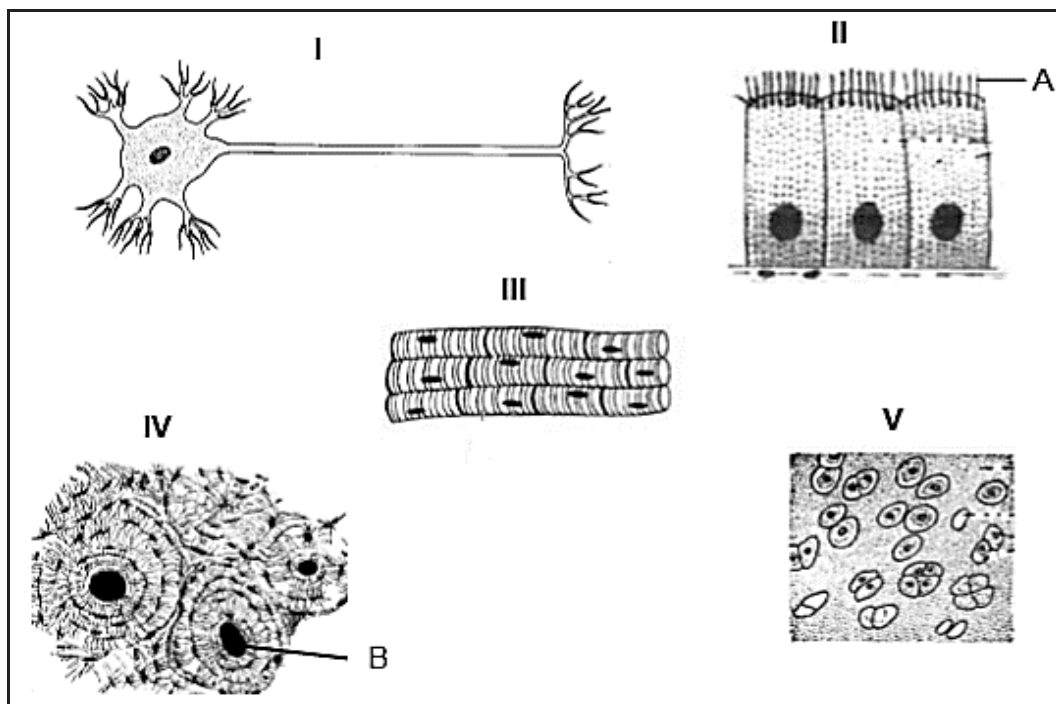
(10 x 1) (10)

1.3 Indicate whether each of the statements in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B**, or **none** next to the question number (1.3.1–1.3.3) in the ANSWER BOOK.

COLUMN I		COLUMN II
1.3.1	Undifferentiated cells present at the tips of stems and roots that are actively dividing by mitosis to produce new cells	A: Meristematic tissue B: Permanent tissue
1.3.2	The softening of bones in children leading to fractures and bone deformity	A: Rickets B: Arthritis
1.3.3	Mammalian tissue	A: Muscle B: Blood

(3 x 2) (6)

1.4 The diagram below shows a group of mammalian tissues.



1.4.1 Write down the LETTER and the NUMBER of the tissue/cell that:

- (a) Forms bones making up the skeleton of mammals (2)
- (b) Carries impulses from the central nervous system to the effectors (muscles or gland) (2)
- (c) Is responsible for voluntary movement, such as leg movements during walking (2)
- (d) Contains microscopic hair-like projections lining nasal cavities and trachea (2)



- 1.5 Study the table below and fill in the missing words indicated by the numbers (1.5.1–1.5.6). Write down **ONLY** the correct answer next to the corresponding number.

TISSUE/CELL	FUNCTION
Blood	1.5.1
1.5.2	Contains haemoglobin which gives red colour to the blood
White blood cells	1.5.3
1.5.4	Forms blood clots
Chlorenchyma	1.5.5
Spongy mesophyll	1.5.6

(6 x 1) (6)

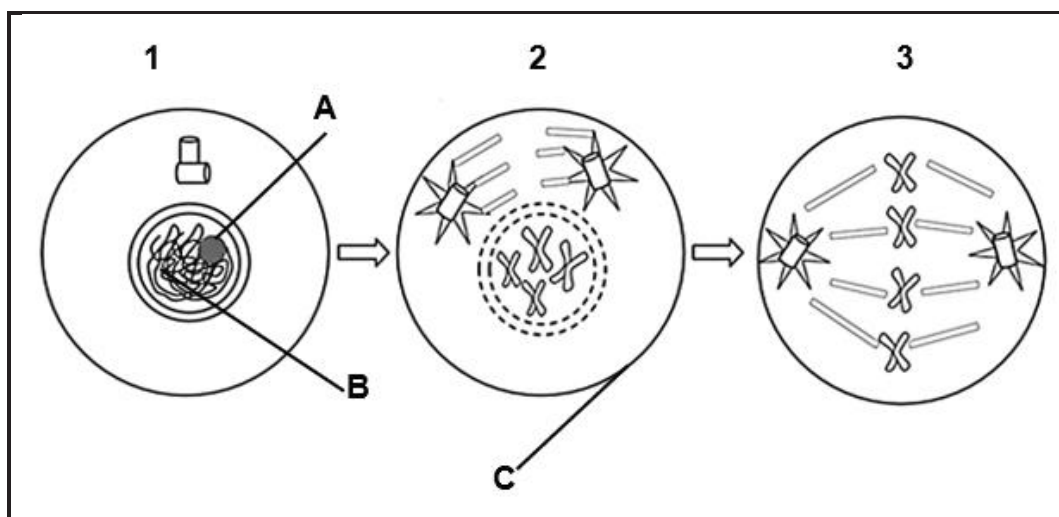
**TOTAL SECTION A: 50**



## SECTION B

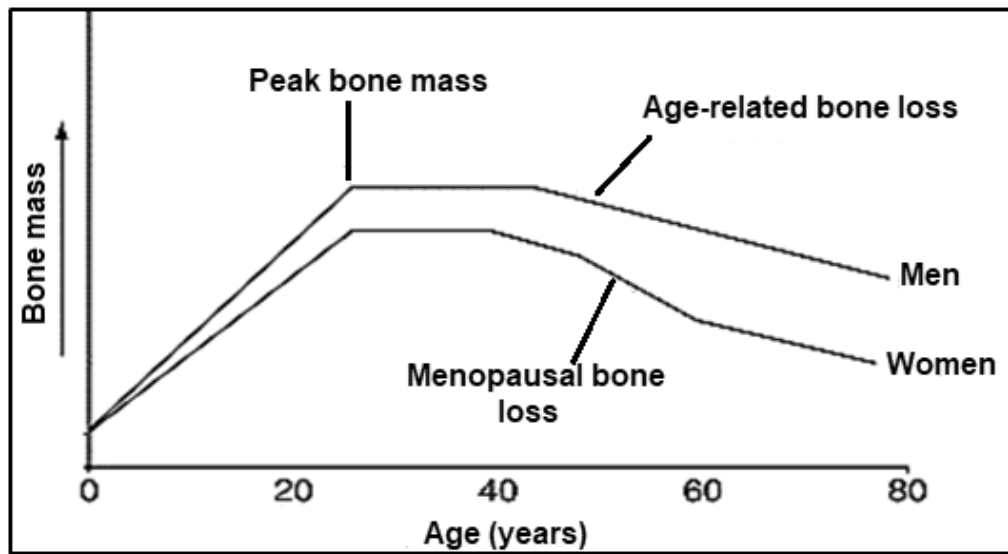
## QUESTION 2

2.1 The diagrams below represent different phases of a particular process.



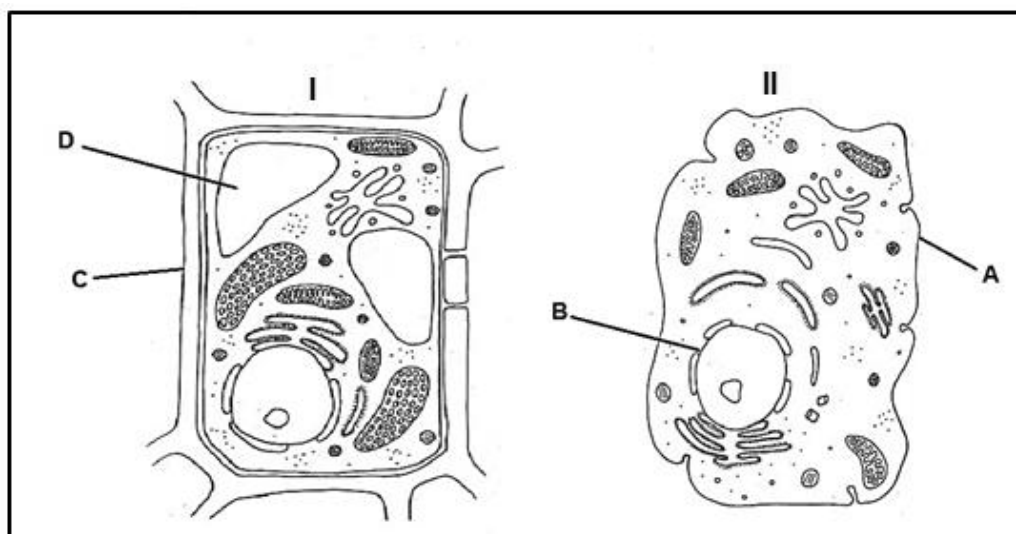
- 2.1.1 Identify the process represented above. (1)
- 2.1.2 Label structures **A**, **B** and **C**. (3)
- 2.1.3 Which phase is represented by diagram **3**? (1)
- 2.1.4 Draw a labelled diagram of a phase which follows the phase mentioned in QUESTION 2.1.3 above. (3)
- 2.1.5 Explain what would happen if the process mentioned in QUESTION 2.1.1 does not take place. (2)

2.2 Study the graph below and answer the questions that follow.



- 2.2.1 Name the disease of the skeletal system in which bones become bent due to poor bone formation. (1)
- 2.2.2 Describe the relationship between bone density and age. (2)
- 2.2.3 With reference to the graph, when is the peak bone density formed in men and women? (2)
- 2.2.4 Give TWO reasons why weight-lifting exercise and calcium-rich foods can lower the risk of developing low bone density. (2)
- 2.2.5 State which part of the body is protected by the cranium. (1)
- 2.2.6 Apart from protection, list any other THREE functions of a skeleton. (3)
- 2.3 Name and describe THREE different skeletal systems found in living organisms. (3 x 2) (6)

2.4 The following diagrams represent different types of cells.



- 2.4.1 Identify the type of cells represented by diagrams **I** and **II**. (2)
- 2.4.2 Give the NUMBER and the NAME of the organelle which serves as a storage site for water and mineral salts. (2)
- 2.4.3 Provide labels for parts **A**, **B** and **C**. (3)
- 2.4.4 State whether part **D** is a permeable, impermeable or selectively permeable membrane. Give ONE reason for your answer. (3)
- 2.4.5 A plant cell in a photograph measures 15 mm across. If the actual size of the cell is 0,015 mm, what is the magnification in the photograph? (3)

**[40]**

## QUESTION 3

3.1 Read the following passage and answer the questions that follow.

Cancer causes more deaths in South Africa than HIV/Aids, tuberculosis and malaria. It is roughly the cause of one in four deaths, meaning 25% of deaths are due to cancer. Globally, however, lung cancer tops the list for men, followed by prostate cancer and colorectal cancer. For women, breast cancer is the most prevalent across the board, then cervical/uterine cancer and lung cancer. The top five cancers by cost were leukemia (R280 000), multiple myeloma (R230 000), cancers of the central nervous system (R180 000), lung cancer (R160 000) and colorectal cancer (R120 000) per case, on average.

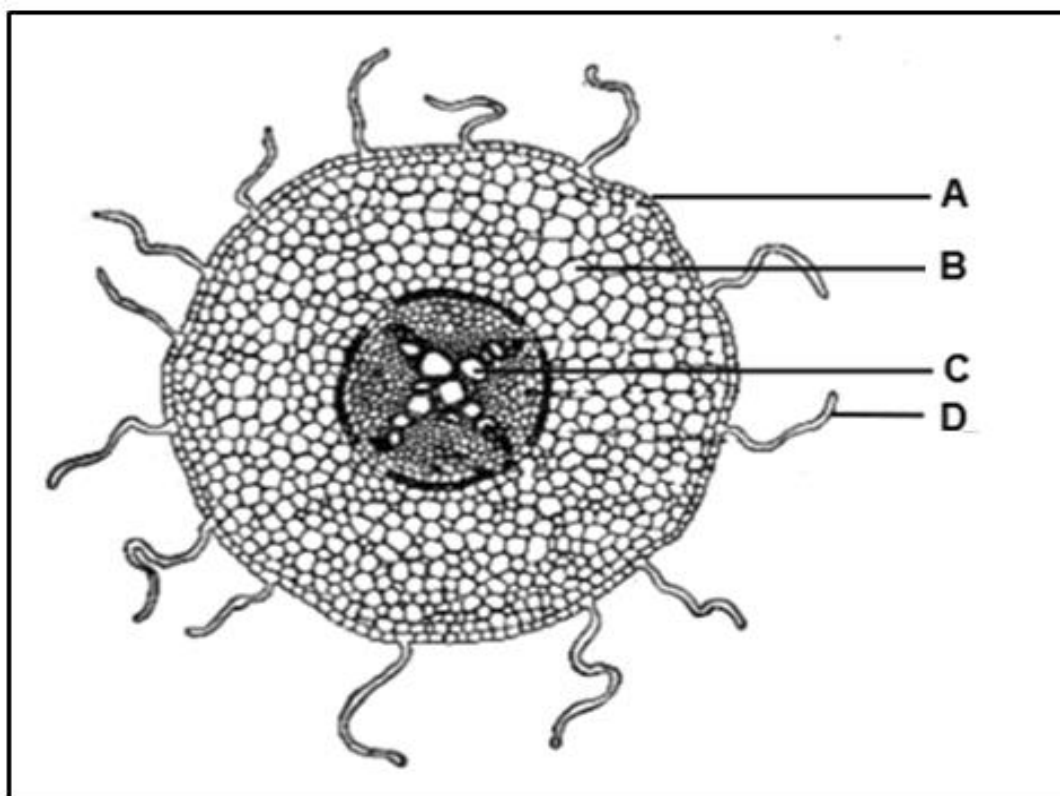
[Source: [www.iol.co.za/cancer](http://www.iol.co.za/cancer), Accessed on 15 September 2018]

- 3.1.1 What is *cancer*? (1)
- 3.1.2 Which type of cancer is most common to males? (1)
- 3.1.3 State TWO ways in which cancer can be treated. (2)
- 3.1.4 Use the information in the table below and draw a bar graph to show the **top five cancers** and the costs per case.

TYPES OF CANCER	CANCERS BY COST
Leukemia	R280 000
Multiple myeloma	R230 000
Cancers of the central nervous system	R180 000
Lung cancer	R160 000
Colorectal cancer	R120 000

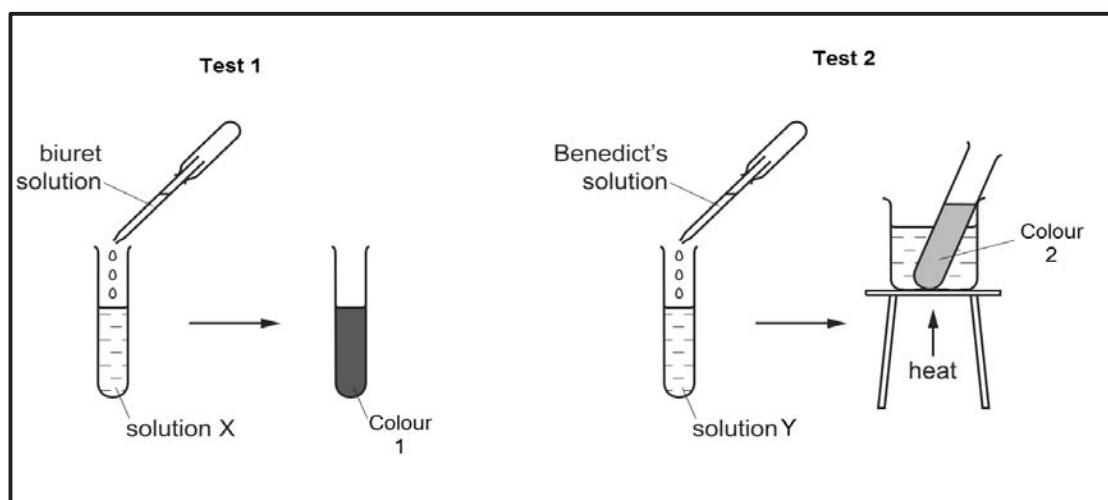
(6)

3.2 Study the diagram below and answer the questions that follow.



- 3.2.1 Name the parts labelled **A–D**. (4)
- 3.2.2 Explain any **TWO** structural adaptations of part **D** that enables it to perform its function effectively. (4)
- 3.2.3 What is the collective name of the tissues that transport water and food in the structure shown above? (1)
- 3.2.4 Give **ONE** function of part **B**. (1)
- 3.2.5 Tabulate **TWO** differences between a cross-section structure of a root and that of a stem. (5)

- 3.3 A group of Grade 10 learners conducted an experiment to test for the presence of certain nutrients. They used egg white, glucose solution, starch powder solution as well as olive oil. The apparatus was set up as indicated below.



- 3.3.1 What is the aim of Test 1 and Test 2 in the above diagram? (2)
- 3.3.2 Identify:
- (a) Solution X (1)
- (b) Solution Y (1)
- 3.3.3 What will be the positive results for colour 1 and colour 2 in the above tests? (2)
- 3.3.4 Give TWO precautionary measures that should be taken into consideration when setting up the above apparatus. (2)
- 3.3.5 List any THREE steps that were followed in the planning of the experiment above. (3)
- 3.3.6 Suggest ONE way in which reliability of the experiment could be improved. (1)
- 3.3.7 Where in the animal tissues can you find the organic compounds tested for in Test 1? (1)
- 3.3.8 Give ONE biological importance of the compound tested for in:
- (a) Test 1 (1)
- (b) Test 2 (1)

**[40]****TOTAL SECTION B: 80**

## SECTION C

### QUESTION 4

A leaf is one of the major important organs of a plant. Describe how the leaf is adapted to perform its functions of photosynthesis, transpiration, respiration and guttation.

Content: (17)  
Synthesis: (3)

**NOTE:** NO marks will be awarded for answers in the form of flow charts, tables or diagrams.

**TOTAL SECTION C: 20**  
**GRAND TOTAL: 150**





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